



APPLICATION NOTE Pulp & Paper

Measuring level of wood chips in a silo with steam injection

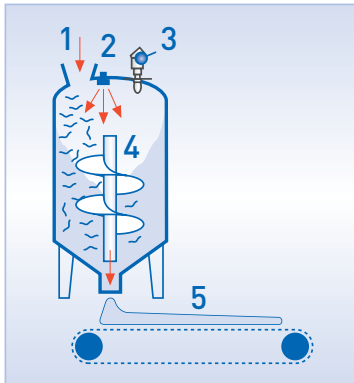
- Avoid condensation issues in a hot and damp environment
- Indicating the level of a low reflective medium with high repeatability
- Accurate level measurement on non-flat and moving product surfaces

1. Background

Using wood to make paper is a fairly recent innovation. It began with the development of mechanical pulping in Germany and Canada in the 1840s. Pulping is a process to separate the wood fibres. In order to prepare the wood for pulping, it needs to be moistened. This is done in silos using steam injection. In order to control production and ensure supply, the level of wood chips in these silos must be continuously measured.

2. Measurement requirements

A pulp mill in China has a silo with steam injection that is 7 metres high. It is filled with wood chips from the top. Then steam is injected at 140°C to soften the wood. A screw blade in the centre of the silo pushes the moistened wood through a hole at the bottom, directly onto a conveyor belt which transports it to the pulping process. The pulp mill previously used a radiometric device to monitor the level of product left in this silo. Meters using this type of technology calculate the density or concentration of the product from the intensity of the received radiation. They do not cope well with variations in density and if the product density changes, the results are inaccurate. Adding the considerable cost and effort associated with radiometric measurement, the customer was looking for a reliable meter that was simple to set up and use.



Silo with steam injection

- 1 Inlet for wood chips
- 2 Steam injection at 140°C
- 3 OPTIWAVE 6300 C with DN 80 PTFE Drop antenna
- 4 Rotating blade
- 5 Moistened wood



Filling entrance



Silo top



OPTIWAVE 6300 C installation on silo top

3. KROHNE solution

After the mill had run tests with devices from several manufacturers, the OPTIWAVE 6300 C non-contact Radar (FMCW) Level Meter with its DN80 PTFE Drop antenna was found to be the most suitable device. KROHNE delivered it with a G 1½ process connection to which the customer attached his 3" 150 lbs flange.

4. Customer benefits

By combining the high signal dynamics with FMCW radar technology, the customer achieved an accurate and reliable measurement even on this low reflective product with a moving, non-flat surface. Because it measures the distance to the product surface and not the product density, this radar device is completely unaffected by density variations. The antenna made of plain PTFE resists temperatures up to 150°C and, with its perfectly smooth surface, minimizes condensation, making purging systems obsolete and the device maintenance-free. The meter is simple to set up and use, thanks to the installation wizard.

5. Product used

OPTIWAVE 6300 C

- Non-contact Radar (FMCW) Level Meter for solids
- 2-wire loop-powered for minimal wiring expense
- Maintenance-free
- Reliable and accurate (± 10 mm – up to 10 m) measurement of low reflective medium on non-flat, moving surfaces.
- Measuring range up to 30 m with the DN 80 Drop antenna
- Dielectric constant (ϵ_r value) ≥ 1.5
- FMCW technology: optimized cost/performance ratio
- PACTware for routine checks & commissioning
- Wizard-driven "Quick Set-up" procedures for configuring the device



Contact

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